1.   A method for network tunneling utilizing flow state information, comprising the operations of:

creating a flow block having flow state information for a received first data packet
5   of a micro-flow;

storing a tunnel identifier for the micro-flow in the flow block, the tunnel identifier identifying a selected network tunnel to be used to transmit the data packet;

indexing an aggregate flow block using the tunnel identifier, the aggregate flow block having tunnel specific information for the selected network tunnel; and

10   transmitting the data packet using the selected network tunnel based on the tunnel specific information.

2.   A method as recited in claim 1, wherein statistics for the selected network tunnel are stored using the aggregate flow block.

15

3.   A method as recited in claim 2, wherein the statistics include utilization statistics for the selected network tunnel.

4.   A method as recited in claim 1, wherein the first data packet is received at a particular ingress linecard.

5.   A method as recited in claim 4, wherein the ingress linecard sends the first

5   data packet to a particular output port of a network tunnel multi-link interface based on utilization of the output port.

6.   A method as recited in claim 5, wherein the ingress linecard sends the first data packet to the output port having the least utilization.

10

7.   A method as recited in claim 1, further comprising the operation of storing the tunnel specific information obtained from the aggregate flow block in the created flow block.

15   8.   A method as recited in claim 7, wherein the tunnel specific information includes at least one of an outgoing label, and an outgoing layer 2 type for an egress router.

9.   A method as recited in claim 8, further including the operation of transmitting a subsequent data packet based on the tunnel specific information stored in the flow block.

5   10.   A router capable of network tunneling utilizing flow state information, comprising:

an aggregate flow block having tunnel specific information for a particular network tunnel; and

a flow block having flow state information for a micro-flow, the flow block
10   further including an identifier that associates the flow block with the aggregate flow block.

11.   A router as recited in claim 10, wherein the aggregate flow block includes an outgoing label associated with the particular network tunnel.

15

12.   A router as recited in claim 11, wherein the aggregate flow block includes a label action associated with the particular network tunnel.

13.   A router as recited in claim 12, wherein the outgoing label and the label

action are copied from the aggregate flow block to the flow block upon creation of the

flow block.

5   14.   A router as recited in claim 10, wherein the aggregate flow block stores

statistics for the particular network tunnel.

15.   A router as recited in claim 14, wherein the statistics include utilization

statistics for the particular network tunnel.

10

16.   A router as recited in claim 12, further comprising a plurality of aggregate

flow blocks, each aggregate flow block being associated with a separate network tunnel.

17.   A router as recited in claim 16, further comprising a plurality of flow

15   blocks, each flow block associated with a separate micro-flow.

18.   A router as recited in claim 17, wherein the plurality of flow blocks

includes flow state information for a particular micro-flow.

PATENT APPLICATION

19.   A method for network tunneling utilizing flow state information,

comprising the operations of:

receiving a first data packet of a micro-flow at an ingress linecard of a router;

creating a flow block having flow state information for a received first data packet

5   of a micro-flow;

storing a tunnel identifier for the micro-flow in the flow block, the tunnel

identifier identifying a selected network tunnel to be used to transmit the data packet;

determining a particular output port on a specific egress linecard for transmitting

the micro-flow;

10   transmitting the first data packet to the specific egress linecard;

indexing an aggregate flow block using the tunnel identifier, the aggregate flow

block having tunnel specific information for the selected network tunnel; and

transmitting the data packet along the selected network tunnel using the particular

output port based on the tunnel specific information.

15

20.   A method as recited in claim 19, wherein the particular output port is a

least utilized output port associated with the selected network tunnel.

21. A method as recited in claim 19, wherein the particular output port is determined based on time.

22. A method as recited in claim 19, wherein statistics for the selected network tunnel are stored using the aggregate flow block.

23. A method as recited in claim 22, wherein the statistics include utilization statistics for the selected network tunnel.

24. A method as recited in claim 19, further comprising the operation of storing the tunnel specific information obtained from the aggregate flow block in the created flow block.

25. A method as recited in claim 24, wherein the tunnel specific information includes an outgoing label.

26. A method as recited in claim 25, further including the operation of transmitting a subsequent data packet based on the tunnel specific information stored in the flow block.

PATENT APPLICATION

27.   A router capable of network tunneling utilizing flow state information, comprising:

an ingress linecard having logic that selects a particular network tunnel for a

5   received micro-flow, the ingress linecard further including logic that selects a particular

egress linecard and a particular port to utilize for transmission of the micro-flow;

an aggregate flow block having tunnel specific information for the selected

network tunnel, the aggregate flow block further including statistics for the selected

network tunnel; and

10   a flow block having flow state information for the micro-flow, the flow block

further including an identifier that associates the flow block with the aggregate flow

block.

28.   A router as recited in claim 27, wherein the aggregate flow block includes

15   an outgoing label associated with the particular network tunnel.

29.   A router as recited in claim 28, wherein the aggregate flow block includes

a label action associated with the particular network tunnel.

PATENT APPLICATION

30.   A router as recited in claim 29, wherein the outgoing label and the label action are copied from the aggregate flow block to the flow block upon creation of the flow block.

5   31.   A router as recited in claim 27, wherein the statistics include utilization statistics for the selected network tunnel.

32.   A router as recited in claim 27, further comprising a plurality of aggregate flow blocks, each aggregate flow block being associated with a separate network tunnel.

10

33.   A router as recited in claim 32, further comprising a plurality of flow blocks, each flow block associated with a separate micro-flow.

34.   A router as recited in claim 33, wherein the plurality of flow blocks

15   includes flow state information for a particular micro-flow.

35.   A method for network tunneling utilizing flow state information, comprising the operations of:

receiving a first data packet of a micro-flow at an ingress linecard of a router;

PATENT APPLICATION

creating a flow block having flow state information for a received first data packet

of a micro-flow;

storing an aggregate flow block tunnel identifier for the micro-flow in the flow

block, the aggregate flow block tunnel identifier identifying a selected network tunnel to

5   be used to transmit the data packet;

determining a particular output port on a specific egress linecard for transmitting

the micro-flow, the particular output port is determined from the aggregate flow block

tunnel identifier; and

transmitting the first data packet and all subsequent data packets to the specific

10   egress linecard using the aggregate flow block tunnel identifier.